What Is Claimed Is:

1.   A scanning head for optical position-measuring systems,
     comprising a receiving grating (1.7) having
     photosensitive areas (3) for scanning locally intensity-
     modulated light of different phase position, the
     receiving grating (1.7) having a semiconductor layer
     stack (1.2) made up of a doped p-layer (1.2.1), an
     intrinsic i-layer (1.2.2) and a doped n-layer (1.2.3),
     wherein the photosensitive areas (3) have in common a
     first of the two doped layers (1.2.1) and at least a part
     of the intrinsic layer (1.2.2) and are electrically
     separated from one another by interruptions of a second
     of the two doped layers (1.2.3).

2.   The scanning head as recited in Claim 1, wherein the
     semiconductor layer stack (1.2) is situated on a
     transparent substrate (1.1) having a conductive, likewise
     transparent electrode (1.3), followed by bottom contacts
     (1.4), so that a layer construction in the order
     -      transparent substrate (1.1)
     -      conductive electrode (1.3)
     -      first doped layer or p-layer (1.2.1)
     -      intrinsic layer (1.2.2)
     -      second doped layer or n-layer (1.2.3)
     -      bottom contact (1.4)
results.

3.   The scanning head as recited in Claim 2, wherein the
     photosensitive areas (3) are defined by the bottom
     contacts (1.4).

4.   The scanning head as recited in Claim 2 or 3, wherein a
     transmitting grating (1.5) is situated on the substrate
     (1.1).

5. The scanning head as recited in Claim 4, wherein the transmitting grating (1.5) is situated in the center of area of the receiving grating (1.7).

6. The scanning head as recited in Claim 5, wherein the transmitting grating (1.4) is completely surrounded by the receiving grating (1.7).

7. The scanning head as recited in one of the preceding claims, wherein the shape of the receiving grating (1.7) approximates an ellipse, whose greater diameter is perpendicular to the measuring direction (M).

8. The scanning head as recited in one of the Claims 4 through 7, wherein a light source (1.6) is assigned to the transmitting grating (1.5).

9. The scanning head as recited in one of the preceding claims, wherein adjacent photosensitive areas (3) emit signals phase-shifted by 180 degrees.+

10. The scanning head as recited in Claim 9, wherein a scale division (T) of the receiving grating (1.7) corresponds to one-half of a period (P) of an incident, locally modulated intensity pattern (L).

11. The scanning head as recited in one of the Claims 1 through 8, wherein adjacent photosensitive areas (3) emit signals phase-shifted by 90 degrees.

12. The scanning head as recited in Claim 11, wherein a scale division (T) of the receiving grating (1.7) corresponds to one-quarter of a period (P) of an incident, locally modulated intensity pattern (L).

13. The scanning head as recited in one of the preceding claims, wherein the semiconductor layer stack (1.2) is formed from amorphous silicon.

14. The scanning head as recited in one of the preceding claims, wherein a residual thickness of the i-layer (1.2.2) between the photosensitive areas (3) is less than a thickness of the i-layer (1.2.2) in the photosensitive areas (3).

15. The scanning head as recited in Claim 14, wherein the residual thickness of the i-layer (1.2.2) is in the range of 5% - 95% of the thickness of the i-layer (1.2.2).

16. The scanning head as recited in Claim 14, wherein the residual thickness of the i-layer (1.2.2) is in the range of 10% - 90% of the thickness of the i-layer (1.2.2).

17. The scanning head as recited in one of the Claims 14 through 16, wherein the residual thickness of the i-layer (1.2.2) is approximately 90% of the thickness of the i-layer (1.2.2).